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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/588,008	06/06/2000	Sam Yang	M4065.0210/P210	9015
24998	7590	05/03/2005	EXAMINER	
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP			TRINH, HOA B	
2101 L Street, NW			ART UNIT	
Washington, DC 20037			PAPER NUMBER	

2814

DATE MAILED: 05/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

HA

**Office Action Summary**

Application No.

09/588,008

Applicant(s)

YANG ET AL.

Examiner

Vikki H. Trinh

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 April 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-31 and 99 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-31, 99 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 January 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/19/05 has been entered.

### **Claim Rejections - 35 USC § 102**

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

It is well settled that the law of anticipation does not require that the reference teach what appellant is teaching or has disclosed, but only that the claims on appeal "read on" something disclosed in the reference, i.e., all limitations of the claims are found in the reference. See *Kalman v. Kimberly Clark Corp.*, 713 F.2d 760, 218 USPQ 781 (Fed. Cir. 1083). Moreover, it is not necessary for the applied reference to expressly disclose or describe a particular element or limitation of a rejected claim word for word as in the rejected claim so long as the reference inherently discloses that element or limitation. See, for example, *Standard Havens Products Inc. v. Gencor Industries Inc.*, 953 F.2d 1360, 21 USPQ2d 1321 (Fed. Cir. 1991).

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2. Claims 1-5, 7, 10-18, 23-31 and 99 are rejected under 35 U.S.C. 102(e) as being anticipated by Narwankar et al. (6,475,854) (hereinafter Narwankar).

Narwankar discloses memory cell capacitor structure in a semiconductor device including:

As to claims 1, 23, and 99, a memory device having a bottom conducting layer 605, a dielectric layer 606 over the bottom conducting layer, a top conducting layer 608 and annealing the entire top conducting layer 608 comprising an oxygen permeable material (col. See Table 1 and figure 6e, col. 1, lines 60-65), which results in an oxidized gas annealed top layer 610. This oxidized gas annealed layer 610 has an upper most portion. See also, Table 1, col. 11, lines 4-50 and col. 10, lines 15-40, and figures 1 and 8 of PA '928. Note that Narwankar teaches a capacitor having a single bottom electrode, a dielectric layer, and a single top electrode (col. 13, lines 23-26).

Also note: The details described in the provisional application 60/173,928 (hereinafter PA '928) of Narwankar are included in Table I. Further, said details are limitations used to apply to the present application claims. Any additional details showed in Table I are not necessarily pertained to the above rejection. Thus, Narwankar has secured the priority date for the limitations used in this Office Action to reject the present application's claims.

As to claims 2-3, 15, the bottom conducting layer 605 and the top conducting layer 610 are formed of a metal material layer selected from a "noble" metal group, i.e. Ru. See col. 10 lines 20-41, or PA '928, page 5, line 11 and page 6, lines 19-22.

As to claims 4-5, 7, 17-18, the bottom layer 605 and the top conducting layer 610 are formed of a metal alloy or conducting metal oxide such as Ru, or RuO<sub>2</sub>. (Table 1 or PA '928, page 5, line 15-16 and page 6, lines 19-22 ).

As to claim 10, the dielectric layer 606 is a dielectric metal oxide layer. (see column 10, lines 24-35 and PA '928, page 6, lines 9-10).

As to claims 11-14, the dielectric layer is a dielectric metal oxide layer with high dielectric constant that falls within the range of 7-300, i.e. Ta<sub>2</sub>O<sub>5</sub>. (See col. 10, lines 24-35, PA '928, page 6, lines 9-10.)

As to claim 16, the top conducting layer 615 may be formed of a non-oxidizing metal permeable to oxygen. (See col. 11, lines 39-50, and Table 1, and PA '928, page 6, lines 19-20.)

As to claims 24-25, the oxygen annealed layer 615 is one annealed in the presence of oxygen and/or oxygen mixture (see Table 1, and PA, page 6, lines 21-25 ).

As to claim 26, the annealed top layer 615 is a remote plasma enhanced annealed top layer (See table I, col. 13, and PA '928, page 6, lines 11-12).

As to claim 27, the annealed top layer is a plasma enhanced annealed top layer (See table I, col. 13, and PA '928, page 6, lines 11-12).

As to claim 28, the annealed top layer is an ultraviolet light annealed top layer (See table I, col. 13, fig. 9b, and PA '928, page 6, lines 11-24).

As to claim 29, the capacitor is a stacked capacitor. (See column 1, line 27, and PA '928, page 2, lines 11-24).

As to claim 30, an access transistor connected to the capacitor. (See col. 1, lines 23-30, and PA '928, page 2, line 11.)

As to claim 31, the capacitor is a DRAM cell. (See column 1, line 21, and PA '928, page 2, line 11).

3. Claims 1, 6, and 8-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Narwankar et al. (6,204,203) (hereinafter Narwankar).

As to claim 1, Narwankar discloses a MIM capacitor having a bottom conducting layer 206 (fig. 2e); a dielectric layer 208/210 (fig. 2e) formed over the bottom conducting layer 206; and at least one top conducting layer 212 (fig. 2e) over the dielectric layer 208/210 (fig. 2e), wherein at least an upper most portion is an oxidized gas annealed layer (col. 9, lines 30-42).

As to claims 6 and 8, the bottom layer is a metal nitride such as tungsten nitride (col. 9, lines 30-42).

As to claim 9, the bottom layer is formed over the an oxygen barrier 204 (fig. 2e).

As to claim 10, the dielectric layer 208/210 (fig. 2e) is a dielectric metal oxide layer.

As to claims 11-14, the dielectric layer is a dielectric metal oxide layer with high dielectric constant that falls within the range of 7-300, i.e. Ta<sub>2</sub>O<sub>5</sub>. (col. 6, lines 4-10.)

1. Claims 1-5, 7, 9-18, 23-31 and 99 are rejected under 35 U.S.C. 102(e) as being anticipated by Li (6,833,605).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

As to claims 1, 23, 99, Li discloses a capacitor (fig. 7) having a bottom conducting layer 54 (fig. 7); a dielectric layer 52 (fig. 7) formed over the bottom conducting layer 54; and a single oxidized annealed top conducting layer 50 (fig. 7) over the dielectric layer 52 (fig. 7) .

As to claims 2-3, 15, the bottom conducting layer 54 (fig. 7) and the top conducting layer 50 are formed of a metal material layer selected from a "noble" metal group, i.e. Ru, Pt. See col. 3, lines 64-67, col. 4, lines 55-60)

As to claims 4-5, 7, 17-18, the bottom layer 54 and the top conducting layer 50 are formed of a metal alloy or conducting metal oxide such as Ru, or RuO<sub>2</sub>. See col. 3, lines 64-67, col. 4, lines 55-60)

As to claim 9, the bottom layer is formed over the an oxygen barrier 56 (fig. 7).

As to claim 10, the dielectric layer 52 is a dielectric metal oxide layer. (col. 4, line 57).

As to claims 11-14, the dielectric layer 52 is a dielectric metal oxide layer with high dielectric constant that falls within the range of 7-300, i.e. Ta<sub>2</sub>O<sub>5</sub>. (col. 4, line 57)

As to claim 16, the top conducting layer 50 may be formed of a non-oxidizing metal permeable to oxygen. (See col. 4, lines 55-60)

As to claims 24-25, the oxygen annealed layer 50 is one annealed in the presence of oxygen and/or oxygen mixture (see col. 5, lines 3-54 ).

As to claim 26, the annealed top layer 50 is a remote plasma enhanced annealed top layer (See 5, lines 13-55, col. 1, line 65).

As to claim 27, the annealed top layer is a plasma enhanced annealed top layer (See col. 1, line 65).

As to claim 28, the annealed top layer is an ultraviolet light annealed top layer (See col. 1, line 65).

As to claim 29, the capacitor is a stacked capacitor (col. 1, lines 15-20.

As to claim 30, an access transistor connected to the capacitor . (See fig. 7)

As to claim 31, the capacitor is a DRAM cell. (See column 1, lines 15-17).

### ***Response to Arguments***

Applicant's argument filed on Nov. 18, 2004, has been considered. However, applicant's argument is not persuasive, because in view of the rejection above the examiner applies Narwankar '854 using the elements disclosed in the provisional application. Also, the examiner notes that Narwankar teaches a capacitor having a single bottom electrode, a dielectric layer, and a single top electrode in col. 13, lines 23-25. Further, it is noted that the examiner acknowledges that a portion of Table I includes other details that appear to be unavailable at the time of the provisional application filed. Nonetheless, Narwankar '854 is still proper and applicable to use in rejecting the present application's claims because the details used in the rejection appear in the provisional application, as recited above, thereby maintaining Narwankar '854's priority date.



Therefore, the examiner maintains the rejection of claims 1-5, 7, 10-18, 99, and 23-31 under 35 U.S.C. 102 (e) as being anticipated by Narwankar '854.

Argument regarding to Durcan is moot.

### **Conclusion**

4. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Vikki Trinh whose telephone number is (571) 272-1719. The Examiner can normally be reached from Monday-Friday, 9:00 AM - 5:30 PM Eastern Time. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Mr. Wael Fahmy, can be reached at (571) 272-1705. The office fax number is 703-872-9306.

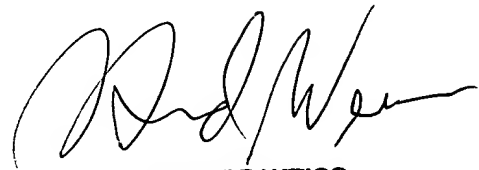
Any request for information regarding to the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Also, status information for published applications may be obtained from either Private PAIR or Public Pair. In addition, status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. If you have questions pertaining to the Private PAIR system, please contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

Lastly, paper copies of cited U.S. patents and U.S. patent application publications will cease to be mailed to applicants with Office actions as of June 2004. Paper copies of foreign patents and non-patent literature will continue to be included with office actions. These cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site ([www.uspto.gov](http://www.uspto.gov)), from the Office of Public Records and from commercial sources. Applicants are referred to the Electronic

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Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197 for information on this policy. Requests to restart a period for response due to a missing U.S. patent or patent application publications will not be granted.

Vikki Trinh,  
Patent Examiner  
AU 2814

A handwritten signature in black ink, appearing to read 'Howard Weiss', is written over a printed name and title.

**HOWARD WEISS**  
**PRIMARY EXAMINER**